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JOURNAL OF

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THE IDENTITY OF IRIS HOOKERI AND THE ASIAN I. SETOSA.

M. FOSTER.

[EDITORIAL NOTE.—The discovery by Dr. G. G. Kennedy two years ago at Cutler, Maine, of the unique *Iris Hookeri*, Penny, formerly known only from the coast of eastern Canada, Labrador and Newfoundland, has drawn much attention to that handsome plant.¹ As a result of recent observations, the range of the species has been more clearly defined than heretofore, and we now know *I. Hookeri* on sea-beaches and headlands from Mallijak (Hamilton Inlet), Labrador, to the Baie des Chaleurs, New Brunswick, and up the St. Lawrence to Saguenay and Kamouraska Counties, Quebec; on Newfoundland, the Magdalen Islands, and Prince Edward Island; and from Sydney, Cape Breton, to Jonesport, Maine. With the attention of New England botanists so recently directed to this northern Iris, it was an especially happy chance which led Miss Mary A. Day, Librarian of the Gray Herbarium, to discover among some papers of the late Sereno Watson a manuscript note upon this plant from Sir Michael Foster, the distinguished secretary of the Royal Society and for twenty years Professor of Physiology at Trinity College, Cambridge. This note which its author permits us to publish was addressed to Dr. Watson shortly before his death.]

In an interesting note in Botanical Gazette, xii. p. 99, May, 1887, on "Our 'tripetalous' species of Iris," you shew that *I. Hookeri* has priority as a name for the Canadian tripetalous species. I have several times received plants under the name "*I. tridentata*," clearly not specimens of Walter's plant [*I. tripetala*], but so identical in all respects with *I. setosa*, Pallas, that, though some of them were said to come from Canada, I thought there must have been some mistake, and that what I had received were simply specimens of the Asian *I. setosa*.

Two years ago, however, Mr. James Fletcher of the Agricultural Department, Ottawa, was so very kind as to send me ripe full capsules and living roots of the tripetalous Iris growing at Dalhousie,

¹ See Kennedy, RHODORA, iv. 24, and Collins, *ibid*, 179, t. 39.

New Brunswick. The capsule and seed were exactly like the capsule and seed of the Asian *I. setosa*. In your note you point out the features of the capsule of the Canadian Iris. I may add that the small dense seed, pyriform or oval except for the very conspicuous raphe, is most distinct. Not only is it wholly different from the wedge-shaped seed of *I. versicolor* (which in turn is almost identical with that of the European *I. pseudacorus*, the two plants being the New World and Old World forms of the same type) but so unlike the seed of other Irises known to me that I think I could always recognize it and detect it mixed with other seed. That of *I. ensata* comes nearest to it.

Mr. Fletcher's root flowered with me last summer (1889), and I must confess that I cannot see in it any specific differences from the Asian *Iris setosa*. The distinguishing feature of *I. setosa* is the diminished inner perianth-segment or standard, in which a very short narrow claw suddenly expands into a minute ala on each side, the two together not reaching the width of 1 cm., and then rapidly narrows to a bristle-like point, the whole segment being only about 1.5 or at most 2 cm. in length. In *I. versicolor*, the standards are sometimes small but never so small as this, and, moreover, they are always ovate or ovate-lanceolate.

The Canadian plant differs from what I may perhaps consider as the typical Asian plant, in the standard not narrowing rapidly to a point from the alae, but, after narrowing somewhat, maintaining the same width for a space and then suddenly becoming pointed; in the blade of the outer perianth-segment being more orbicular; in the claw of the same having a more pronounced flange at its base; in the white patch or "signal" at the junction of the claw and blade being less sharply defined, and in the ovary being more distinctly grooved on the sides. In all these features, however, except the first, seedlings of the Asian *I. setosa* vary a good deal. The inflorescence of the Canadian plant was not so full and the foliage not so luxuriant as those of a well grown Asian plant; but these, I take it, are merely matters of cultivation. The slight apparently permanent difference noted above, seems to be hardly enough to found a species upon. The Canadian plant is at most a variety and might be called *Iris setosa*, var. *canadensis*.

I may add that a plant said to come from Newfoundland, which my friend Mr. Max Leichtlin of Baden Baden gave me, appears to

be identical with Mr. Fletcher's plant. Both are much more like the Asian *Iris setosa* than a plant, which I also received from Mr. Leichtlin, which was said to come from Alaska, and which, though really an *I. setosa*, more fully perhaps deserves an independent name than does the Canadian form. Its deep rich purple flowers and tall habit make it a handsome plant.

It is interesting to observe that *Iris setosa*, like so many other of your North American plants of Asian origin, has been driven to your eastern seaboard, and nearly pushed out of the country. I can learn no evidence of its existence between Alaska on the west and East Canada. The *I. versicolor* of Canada appears to me wholly identical with the *I. versicolor* of the States but of less luxuriant growth.

SHELFORD, CAMBRIDGE, ENGLAND, January 11, 1890.

RECENTLY RECOGNIZED SPECIES OF CRATAEGUS IN EASTERN CANADA AND NEW ENGLAND,—IV.

C. S. SARGENT.

§ COCCINEAE.

* Anthers pale yellow.

CRATAEGUS COCCINEA, Linnaeus. Sargent, *Silva N. Am.* xiii. 133, t. 683.

The range of this species can now be extended along the coast of CONNECTICUT where it has been found by *Graves* near New London, by *Harger* at Oxford and Southbury, and by *Eames* at Stanford on the Hoosatic River.

Crataegus Gravesii, n. sp. Leaves ovate to obovate, acute or rounded at the apex, narrowed from below the middle to the concave-cuneate or rarely rounded entire base, and slightly divided above the middle into 3 or 4 pairs of broad acute lobes; when they unfold tinged with red and coated above with silky white hairs and nearly fully grown when the flowers open and then membranaceous, light green and slightly hairy above with scattered pale hairs; at maturity thin but firm in texture, glabrous, dark green and lustrous on the upper surface, pale yellow-green on the lower surface, usually 3.5-4 cm. long and 2.5-3 cm. wide, with slender yellow midribs and 3 or 4

pairs of slender primary veins extending obliquely to the points of the lobes, or occasionally 3-nerved; petioles slender, more or less wing-margined at the apex by the decurrent base of the leaf-blades, slightly hairy and often glandular early in the season, 1-1.4 cm. in length; on leading shoots leaves often broadly ovate, rounded, slightly cordate or broadly cuneate at the base, coarsely serrate and divided into numerous short acute lateral lobes, 5-6 cm. long and nearly as wide, with thick rose-colored midribs and stout winged petioles. Flowers 1.5-1.6 cm. in diameter on slender slightly hairy or glabrous pedicels, in compact 5-16, mostly 10-12, flowered compound corymbs; bracts and bractlets linear and acuminate to lanceolate, glandular, pink; calyx-tube narrowly obconic, light green, the lobes gradually narrowed from broad bases, linear, acuminate, tipped with bright red glands, finely glandular-serrate usually only above the middle, reflexed after anthesis, deciduous from the ripe fruit; stamens 4-10, usually 7 or 8; anthers small, pale yellow; styles 2 or 3, very rarely 4, surrounded at the base by a narrow ring of pale tomentum. Fruit in erect few-fruited compact clusters, globose or depressed globose, dark orange-red, marked by numerous large dark dots, 7-11, usually about 8 mm. in diameter; calyx small with a broad, shallow cavity; flesh pale yellow-green, dry and mealy; nutlets 2 or 3, full and rounded at the ends, prominently ridged on the broad rounded back, about 6 mm. in length.

A tree occasionally 6 m. in height with a trunk 1-1.5 dm. in diameter, covered with dark gray bark separating into small thin scale-like plates, wide-spreading and ascending branches forming a flattened dome-shaped head, more often shrubby with several stout stems and a broad round-topped or flattened head, 2-3 m. tall and broad; branchlets slender, nearly straight or slightly zigzag, marked by large pale lenticels, dark orange-green and slightly or densely villose or glabrous when they first appear, light red-brown and lustrous during their first season and dull gray-brown the following year, and armed with numerous slender nearly straight bright red-brown and shining ultimately ashy spines 3-6 cm. in length. Flowers during the first week in June. Fruit ripens late in September and begins to fall about the 10th of October. In the autumn the leaves turn a dull yellow color.

CONNECTICUT: Abundant on the glacial gravel of Poquonomoc Plain east of Poquonomoc River and on adjacent boulder-covered ridges, Groton, *C. B. Graves*, June and September 1901, *C. S. Sargent*, August 1902; Terrace north of Gales Ferry Cove, Ledyard, *C. B. Graves*, June and September 1901; Southington, *L. Andrews*, June and September 1902; North Canaan, *C. H. Bissell*, September

1901; State Line, Salisbury, *C. H. Bissell*, May and September 1902. MASSACHUSETTS; hill west of the main street, Great Barrington, *Brainerd and Sargent*, May 31, 1902, *C. S. Sargent*, September 1902; roadside, North Adams to Williamstown, *Brainerd and Sargent*, May 29, 1902, *C. S. Sargent*, September 1902; Amherst, *G. E. Stone*, May 1902. VERMONT: Vergennes, *Ezra Brainerd*, August and September 1900, June 1901. NEW YORK: Westport, *C. H. Peck*, May 1902.

The plants growing on the Poquonomoc Plain should be considered to represent the type of this species. The specimens collected by *Andrews* at Southington have much more hairy young branchlets and corymbs and larger fruit, and the plants from northern Connecticut, Massachusetts and New York are quite glabrous with the exception of the hairs on the upper surface of the young leaves.

I am glad to associate with this distinct species the name of Dr. C. B. Graves of New London, who has patiently and successfully studied during the last two years the numerous forms of *Crataegus* which he has found in New London County, Connecticut.

***Crataegus Faxonii*, n. sp.** Leaves broadly ovate to suborbicular or rarely oval, rounded and short-pointed or acuminate at the apex, rounded, truncate or cuneate at the usually broad entire often glandular base, finely serrate above, with straight incurved teeth tipped with large dark glands, and slightly divided into 4 or 5 pairs of short acute or acuminate lobes; coated above until after the flowering time with long soft white hairs and densely hoary tomentose below; at maturity thin but firm in texture, dark dull green and glabrous on the upper surface, pale and glabrous on the lower surface, with the exception of a few hairs scattered along the stout midribs deeply impressed above and the prominent primary veins arching obliquely to the points of the lobes, 4–5 cm. long and 3.5–4 cm. wide, or on leading shoots often 6 cm. long and wide; petioles slender, grooved, often slightly winged at the apex by the decurrent base of the leaf-blades, villose at first, glandular with minute dark red scattered glands caducous except on vigorous shoots, glabrous in the autumn, 2–2.5 cm. in length; stipules linear to oblong-obovate, acute, finely glandular-serrate, villose, 7–8 mm. in length, caducous. Flowers 1 cm. in diameter on short stout villose pedicels, in compact 7–9-flowered densely villose compound corymbs; bracts and bractlets linear to oblong-obovate, acuminate, finely glandular-serrate, turning brown in fading, caducous; calyx-tube broadly obconic, villose particularly toward the base, the lobes gradually narrowed, slender, acuminate, slightly villose, glandular-serrate; stamens 5–10, usually 5; anthers pale yellow; styles 3 or 4. Fruit mostly erect on stout glabrous or slightly villose peduncles, in few-fruited clusters, oblong, full and rounded at the ends, dark crimson, lustrous, marked by few large

pale lenticels, 1-1.2 cm. long, 8-10 mm. wide; calyx small, with a narrow deep cavity and spreading and reflexed villose lobes, the tips mostly deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets 3 or 4, full and rounded at the ends, prominently ridged on the broad back, with a high rounded ridge, 8-9 mm. long.

A shrub 3-3.5 m. in height with numerous stout spreading stems forming a broad round-topped handsome head, and slender nearly straight branchlets coated at first with long matted pale hairs, soon glabrous, light red-brown and marked by occasional large pale lenticels during their first season, dark gray-brown the following year and armed with slender slightly curved light chestnut-brown and shining ultimately ashy gray spines 4-4.5 cm. in length. Flowers from the 20th to the end of May. Fruit ripens at the end of September.

NEW HAMPSHIRE: river banks and open rocky pastures, Franconia, *C. E. Faxon*, September 1890, 1899, 1900, May 1901.

Crataegus Jackii, n. sp. Leaves obovate-cuneate to oblong-cuneate or rarely oval, acute, or on vigorous shoots broadly ovate and rounded or cordate at the base, to orbicular, finely and doubly serrate except toward the base, with incurved glandular teeth, and sometimes slightly divided above the middle into short acute lobes; tinged with red and villose-pubescent above, this often as they unfold and nearly fully grown and almost glabrous when the flowers open; at maturity thin but firm in texture, dark dull green on the upper surface, pale on the lower surface, 3-4 cm. long, 2-3 cm. wide, or on leading shoots often 5 cm. in diameter, with stout midribs and 3 or 4 pairs of slender primary veins extending to the points of the lobes; petioles slender, more or less wing-margined toward the apex, glandular, with numerous small bright red glands, mostly deciduous before autumn, 3-4 cm. long; stipules oblong-obovate to linear, acuminate, glandular-serrate, caducous. Flowers 2 cm. in diameter, in broad many-flowered thin-branched compound villose corymbs; bracts and bractlets conspicuous, oblong-obovate, glandular-serrate; calyx-tube broadly obconic, glabrous, the lobes gradually narrowed from broad bases, oblong, acuminate, coarsely glandular-serrate, slightly villose on the upper surface, reflexed after anthesis; stamens 5-10, usually 5; anthers pale yellow; styles 2 or 3, surrounded at the base by a narrow ring of pale tomentum. Fruit in many-fruited drooping glabrous clusters, ovate to oblong, prominently angled, full and rounded at the ends, dull dark red, marked by occasional small pale dots, 1.2-1.4 cm. long, 1-1.2 cm. thick; calyx small, with a narrow shallow cavity and acuminate closely appressed lobes coarsely serrate above the middle, villose-above, dark red toward the base on the upper side; flesh thick, somewhat juicy, bitter, white tinged with red; nutlets 2 or 3, broad, rounded at the ends, rounded and prominently ridged on the back, with a broad grooved ridge, 8 mm. in length.

A broad round-topped very intricately branched shrub rarely extending 3 metres in height with slender zigzag branchlets light green more or less tinged with red when they first appear, orange or reddish brown during their first season, becoming dull gray-brown in their second year and armed with numerous nearly straight slender spines from 3 to 6 cm. in length. Flowers at the end of May. Fruit ripens late in September.

PROVINCE OF QUEBEC: lime stone ridges near the shores of Lake St. Lawrence; Caughnawaga, May 1900, May and September 1901, May 1902, Highlands, May and September 1901; St. Ann, May and September 1902, *J. G. Jack*.

***Crataegus Aboriginum*, n. sp.** Glabrous with the exception of a few long pale caducous hairs on the upper surface of the young leaves. Leaves ovate to rhombic, concave-cuneate at the entire glandular base, finely and often doubly serrate, with incurved teeth tipped with small red glands, and more or less deeply divided above the middle into broad acute lobes; membranaceous, pale yellow-green and almost glabrous when the flowers open; at maturity thin but firm in texture, dark yellow-green and lustrous on the upper surface, pale yellow-green on the lower surface, 5–6 cm. long, 3.5–5 cm. wide, with stout often rose-colored midribs and 3 or 4 pairs of slender veins arching obliquely to the points of the lobes; petioles stout, narrowly wing-margined and grooved nearly to the middle, glandular with minute dark glands mostly toward the apex, often rose-color late in the season, about 2 cm. in length; stipules linear and acuminate to lanceolate, coarsely glandular-serrate, sometimes 1–2 cm. in length, caducous. Flowers about 1.4 cm. in diameter on long slender pedicels, in thin-branched rather compact many flowered compound corymbs; bracts and bractlets very large and conspicuous, oblong-obovate, acute, sometimes falcate, coarsely glandular-serrate, mostly deciduous before the flowers open; calyx-tube broadly obconic, the lobes abruptly narrowed from the base, broad, acuminate, coarsely glandular-serrate, reflexed after anthesis; stamens 10; anthers pale yellow; styles 2–4. Fruit in drooping few-fruited clusters, subglobose to short-oblong, full and rounded at the ends, dark red, slightly pruinose, about 1.4 cm. long; calyx enlarged with a broad deep cavity and foliaceous coarsely serrate lobes dark red on the upper side near the base, usually erect and incurved, 7–9 mm. in length; flesh thin, hard, green and bitter; nutlets full and rounded at the ends, thick, ridged on the back, with a broad rounded often grooved ridge, about 9 mm. in length.

A broad shrub with stems about 3 m. in height and very stout branchlets marked by oblong pale lenticels, dark orange-green when they first appear, bright red-brown and lustrous during their first

year, light reddish brown or gray slightly tinged with red and lustrous during their second season, and armed with thick nearly straight bright chestnut-brown shining spines 3-4 cm. in length. Flowers at the end of May. Fruit ripens the first of October.

PROVINCE OF QUEBEC: Roadside in the Indian village of Caughnawaga in the Caughnawaga Reservation, near the southern bank of the St. Lawrence River at the Lachine Rapids, *J. G. Jack*, August and September 1899, May and September 1900.

Although still known only in a single individual, I venture to describe this plant as it is one of the most interesting and distinct of Mr. Jack's numerous discoveries in the neighborhood of Montreal, differing as it does from all the other species of this group in the large and very conspicuous bracts and bractlets of the inflorescence, and the much enlarged foliaceous lobes of the mature calyx.

Crataegus Brunetiana, n. sp. Leaves rhombic to oblong-ovate or rarely and usually only on vigorous shoots to ovate, acute, mostly concave-cuneate and gradually or abruptly narrowed to the glandular base, sharply and generally doubly serrate, with straight or incurved teeth tipped with small dark red persistent glands, and more or less deeply divided into numerous acuminate lobes; as they unfold tinged with red, and villose above and along the midribs and veins below, and when the flowers open nearly fully grown and glabrous with the exception of a few pale hairs on the upper surface; at maturity subcoriaceous, glabrous, dark green and lustrous above, light yellow-green below, 5-8 cm. long, 3.5-5 cm. wide, with stout midribs and 4 or 5 pairs of primary veins arching to the points of the lobes; petioles stout, more or less wing-margined above, glandular, with numerous small dark red glands mostly deciduous before autumn, often bright red late in the season like the lower part of the midribs; stipules oblong-obovate, rounded or acute at the apex to lanceolate, coarsely glandular-serrate, caducous. Flowers about 1.8 cm. in diameter on elongated slender pedicels, in broad thin-branched open compound many-flowered corymbs; bracts and bractlets oblong-obovate to lanceolate, glandular-serrate, caducous; calyx-tube narrowly obconic, thickly coated with long matted white hairs, the lobes gradually narrowed from broad bases, acuminate, coarsely glandular-serrate, villose on the upper surface; stamens 10; anthers pale yellow; styles 3 or 4, surrounded at the base by a broad ring of pale tomentum. Fruit on long pedicels, in many-fruited gracefully drooping slightly villose clusters, oblong or slightly obovate, full and rounded at the ends, crimson, lustrous, marked by occasional large pale dots, 1.3 to 1.5 cm. long, about 1 cm. thick; calyx-cavity deep and narrow, the lobes elongated, acuminate, glandular-serrate, villose on the upper surface, red above toward the base, closely appressed,

persistent; flesh thick, greenish yellow, dry and mealy; nutlets 3 or 4, thick, acute at the ends, prominently ridged on the back, with a broad often grooved ridge, 5–6 mm. long.

An arborescent shrub beginning to flower when not more than 1.5 metres high, and when fully grown often 6 or 7 metres in height, with numerous stems sometimes 3 dcm. in diameter, forming an open irregular head, and stout zigzag branchlets sparingly marked by oblong pale lenticels, villose and yellow-green when they first appear, soon glabrous, bright red-brown and lustrous during their first season, ashy gray or light brown the following year, and armed with numerous stout straight bright chestnut-brown spines 5–7 cm. in length. Flowers June 1st. Fruit ripens at the end of September and often remains on the branches until the end of October or until after the leaves have fallen.

PROVINCE OF QUEBEC: valley of the St. Lawrence River near the City of Quebec, Montmorency Falls, September 1900, May and September 1901, Levis, September 1900, May and September 1900, Isle of Orleans, September 1900, May and September 1901, *J. G. Jack*; banks of St. Charles River, City of Quebec, May and October 1902, *R. Bell*. A specimen with immature fruit collected by *Mr. Ezra Brainerd* at Roberval, Lake St. John, Province of Quebec, August 11, 1901, is probably of this species.

This handsome shrub, first found near the city where he lived for many years, recalls in its name that of the Abbé Ovide Brunet, a professor at Laval University and the author of important papers on the trees and other plants of Canada.

Crataegus Keepii, n. sp. Leaves obovate to rhombic, rarely to oval, acuminate, gradually narrowed to the entire glandular base, finely sometimes doubly serrate above, with straight teeth tipped with large dark red persistent glands, and slightly divided above the middle into 3 to 5 pairs of short acuminate lobes; nearly fully grown when the flowers open and then membranaceous, dark green and slightly hairy above, with white caducous hairs and pale and glabrous below; at maturity coriaceous, dark green and very lustrous on the upper surface, pale on the lower surface, 4–6 cm. long, 3–4 cm. wide, with stout yellow midribs deeply impressed above like the slender, primary veins arching to the points of the lobes; petioles slender, wing-margined at the apex by the decurrent base of the leaf blades, slightly grooved, glandular, at first sparingly hairy, soon glabrous, often rose color in the autumn, 2–2.5 cm. in length; stipules linear; acuminate turning red before falling. Flowers on elongated slender slightly villose pedicels, in lax 6–11-flowered thin-

branched villose compound corymbs; calyx-tube narrowly obconic, glabrous except at the very base, the lobes gradually narrowed from below, acuminate, coarsely glandular-serrate, villose on the inner surface, reflexed after anthesis; stamens usually 8; anthers pale yellow; styles 3 or 4. Fruit in drooping slightly villose clusters, oblong, full and rounded at the ends, bright clear red, lustrous, conspicuously marked by very large white dots, 1.1–1.2 cm. long, about 9 mm. wide; calyx small, sessile, with a deep narrow cavity and spreading closely appressed lobes villose on the upper side; flesh thin, yellow, dry and mealy; nutlets 3 or 4, thin, acute at the ends, prominently ridged on the back, with a narrow rounded ridge, 8 mm. in length.

A large arborescent shrub sometimes 4 or 5 m. in height with numerous stems forming a broad open head, and slender nearly straight branchlets marked by large pale lenticels, dark orange-green and villose when they first appear, dull light reddish brown during their first season, dull ashy gray the following year, and unarmed or sparingly armed with nearly straight dark red-brown spines about 4 cm. in length. Flowers during the first week of June. Fruit ripens early in October.

MAINE: river thickets of the valley of the lower Aroostook where it is the common species and very beautiful in autumn when it is covered with its abundant brilliant fruit; Fort Fairfield, September 1900, June and September 1901, *M. L. Fernald*.

This species is named for Marcus Rodman Keep, "Parson" Keep, for forty-eight years a resident in Aroostook Co., a clergyman and missionary at large, widely identified with the educational and agricultural development of his adopted state, a friend of the poor, and the helpful adviser of all who sought information on the flora of northern Maine.

* * Anthers pink.

Crataegus Fernaldi, n. sp. Leaves ovate to rhombic, long-pointed at the apex, gradually or abruptly narrowed at the entire or glandular base, finely often doubly serrate above, with incurved teeth tipped with large dark red glands, and deeply divided above the middle into 4 or 5 pairs of narrow acuminate lobes; nearly fully grown when the flowers open and then membranaceous, light yellow-green and slightly hairy along the midribs above, pale and villose below, with scattered hairs persistent during the season on the stout yellow midribs and primary veins extending very obliquely to the points of the lobes; at maturity thin but firm in texture, dark green and lustrous on the upper surface, light yellow-green on the lower

surface, 5–6 cm. long, 4–5 cm. wide; petioles slender, wing-margined at the apex, deeply grooved, at first villose, soon glabrous occasionally glandular with minute scattered caducous glands 2–3 cm. in length; stipules linear, acuminate turning red before falling, caducous. Flowers 2 cm. in diameter on slender elongated villose pedicels, in lax many-flowered thin-branched villose corymbs; bracts and bractlets linear, acuminate, glandular-serrate, caducous; calyx-tube narrowly obconic, thickly coated with long matted white hairs, the lobes broad, acuminate, coarsely glandular-serrate, glabrous; stamens 10; anthers pink; styles 3, surrounded at the base by a broad ring of pale tomentum. Fruit on long slightly hairy pedicels, in many-fruited gracefully drooping clusters, obovate and gradually narrowed at the base, bright scarlet, lustrous; calyx small, sessile, with a small deep cavity and spreading mostly appressed lobes often deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets 3, acute at the ends, prominently ridged on the broad back, with a high rounded ridge, about 8 mm. in length.

A shrub sometimes 4 or 5 m. in height with numerous stems forming an open head often broader than high, and comparatively slender nearly straight branchlets light orange-green and hairy when they first appear, with pale hairs, mostly caducous, but occasionally persistent until autumn, light red-brown, lustrous and marked by large pale lenticels during their first season, becoming darker in their second and usually ashy gray in their third year, and armed with many stout straight or slightly curved red-brown and lustrous ultimately ashy gray spines 5–7.5 cm. in length. Flowers during the first week of June. Fruit ripens at the end of September and soon falls.

MAINE: valley of the lower Aroostook River, river banks at Fort Fairfield, July 1893, June and September 1901, *M. L. Fernald*; Valley of the St. John River at Fort Kent, July 1900, *E. F. Williams*.

Crataegus Fernaldi with its lax elongated extremely villose corymbs, large flowers, pink anthers, and pear-shaped fruits gracefully drooping on their long stems in wide clusters, is one of the most distinct plants in this group, and one of the interesting discoveries made by the industrious and successful explorer and student of the flora of Maine whose name is appropriately associated with it.

CRATAEGUS PRAECOX, Sargent, RHODORA, iii. 27 (1902). This name having been used by Loudon for the early flowering Glastonbury Thorn, a variety of *Crataegus Oxyacantha* (*Arb. Brit.* ii. 833 [1830]), I propose the name of *Crataegus praecoqua* for this American species. It was through an error that the anthers of the type of

this species from Crown Point, New York, were described as pale yellow. They are pink, and the specimens collected by Mr. Jack in the Province of Quebec, with yellow anthers and previously referred to *Crataegus praecox*, can perhaps best be referred to *Crataegus coccinea*, Linnaeus, although these Canadian plants show great variation in the time their fruit ripens.

ARNOLD ARBORETUM.

A NEW STATION FOR DENTARIA MAXIMA.

C. H. BISSELL.

OF the three species of pepper-root known to New England, *Dentaria maxima*, Nutt. is the most rarely found and the reported stations for it have all been in the state of Vermont, although I learn that there is in the Herbarium of the New England Botanical Club a specimen of this species collected at Lowell, Massachusetts, by Mr. W. P. Atwood, May, 1883. The two other species, *D. laciniata*, Muhl. and *D. diphylla*, Michx., are found in various parts of New England and are locally pretty well known. All the species develop foliage and flowers very early in the season before most other plants have started and they have finished their growth and often disappear by the first of July. In this part of Connecticut *D. laciniata* and *D. diphylla* are found in moist or wet places in rich soil among rocky woods and are not common. At one station of which I shall speak, they are comparatively plentiful. This place, a rocky wooded hillside with soil mostly a rich humus, moist all through, with springs along its lower edge, covers an area of perhaps an acre and is a fine station for early flowers. In late April or the first week in May, the date varying according to the season, when most of the woods are still brown and bare this spot is a mass of flowers and verdure. The first to come is the delicate little squirrel corn, *Dicentra canadensis*, DC. This is quickly followed by its near relative the Dutchman's Breeches, *Dicentra Cucullaria*, DC., and one of the pepper-roots, *Dentaria laciniata*, these two in greater numbers than any of the others. A few days later the other pepper-root, *D. diphylla* and the smooth yellow violet, *Viola scabriuscula*, Schwein. add their flowers

to the display. When visiting this spot last year in the first days of May I collected some plants that at first I thought were only a peculiar form of *D. diphylla*. A more careful examination of the specimens, however, showed a decided difference in the rootstock. Another visit was then made to the station, more material collected and observations made.

Specimens of this peculiar form were later sent to the Gray Herbarium and found by Dr. Robinson to be the rare *Dentaria maxima*, Nutt. Hartford County, Connecticut can now be added to the recorded stations for this species in New England. As the plant is little known some notes may be of interest.

There were found two colonies of about a dozen plants each surrounded by plants of both the other species. There has been some discussion as to the time of flowering of *D. maxima*. At this station *D. laciniata* bloomed a week or ten days earlier than *D. diphylla*. *D. maxima* was almost exactly intermediate in time between the other two. It is supposed to be a larger plant than the others but was about the same size in this case.

The basal leaves were like those of the stem. There were usually three leaves on a stem, sometimes two and occasionally four, when three the upper one was smaller, when four, the last one was very much smaller than the others.

The flowers were nearly white, just tinged with rose or purple much like those of *D. laciniata*. None of the plants matured fruit, in this respect following *D. diphylla* which seems hardly ever to form seed in this section.

The rootstock is larger and longer than that of *D. laciniata*, it is jointed and tubercled, grows deeper in the ground and is not at all like that of *D. diphylla*.

SOUTHINGTON, CONNECTICUT.

SINCE above was in type has come a report of the finding of *Dentaria heterophylla*, Nutt. in Litchfield County, Connecticut, thus making four known species of *Dentaria* in New England instead of three as stated above.—C. H. B.

SPLACHNUM AMPULLACEUM, A CORRECTION.—The moss reported from Mt. Ktaadn as *Splachnum roseum* (RHODORA 5: 44) has proved on further study to be *S. ampullaceum* and I wish to place on record this correction.—LEROY H. HARVEY, University of Chicago.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS,— XI,
HEPATICAÆ.¹

ALEXANDER W. EVANS.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.]

RICCIAEAE.		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Riccia arvensis Aust.					—	+
“ crystallina L.						+
“ fluitans L.	+		—	+	—	+
“ Sullivantii Aust.				+	+	+
Ricciocarpus natans (L.) Corda	+	+	+	+	+	+

MARCHANTIAEAE.		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Asterella tenella (L.) Beauv.	+		—	+	+	+
Conocephalum conicum (L.) Dumort.	+	+	+	+	+	+
Grimaldia fragrans (Balb.) Corda			+	—	—	+
Lunularia cruciata (L.) Dumort.			+	+	—	+
Marchantia polymorpha L.	+	+	+	+	+	+
Preissia quadrata (Scop.) Nees	+	+	+	+	—	+
Reboulia hemisphaerica (L.) Raddi	+		+	+	—	+

METZGERIACEAE.		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Blasia pusilla L.	+	+	+	+	+	+
Fossombronina foveolata Lindb.	+	+		+	+	+
“ salina Lindb.						+
“ Wondraczekii (Corda) Dumort.		+				+
Metzgeria conjugata Lindb.	—	+	+	+	—	+
Pallavicinia Lyellii (Hook.) S. F. Gray	+	+		+	+	+
Pellia epiphylla (L.) Corda	—	+	+	+	+	+
Riccardia latifrons Lindb.	+	+	+	+		+
“ multifida (L.) S. F. Gray	+	+	—	+	—	+
“ palmata (Hedw.) S. F. Gray	—			—	—	+
“ pinguis (L.) S. F. Gray		+	+		—	+
“ sinuata (Dicks.) Trevis.				+	—	+

¹ Printed in RHODORA as supplementary material.

JUNGERMANNIACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Anthelia Juratzkana</i> (Limpr.) Trevis.		+				
<i>Archilejeunea clypeata</i> (Schwein.) Schiffn.				+		+
“ <i>Sellowiana</i> Steph.					+	
<i>Bazzania triangularis</i> (Schleich.) Lindb.		+	+	+		+
“ <i>trilobata</i> (L.) S. F. Gray	+	+	+	+	+	+
<i>Blepharostoma trichophyllum</i> (L.) Dumort.	+	+	+	+		+
<i>Cephalozia bicuspidata</i> (L.) Dumort.	+	+	+	+		+
“ <i>catenulata</i> (Hübner.) Lindb.	+		—		—	+
“ <i>connivens</i> (Dicks.) Lindb.				+	—	+
“ <i>curvifolia</i> (Dicks.) Dumort.	+	+	+	+	—	+
“ <i>divaricata</i> (Smith) Dumort.	+	+	+	+	+	+
“ <i>fluitans</i> (Nees) Spruce	+					+
“ <i>Francisci</i> (Hook.) Dumort.	+					
“ <i>Jackii</i> Limpr.				+		
“ <i>lunulaefolia</i> Dumort.	+	+	+	+	—	+
“ <i>Macounii</i> Aust.	+	+				
“ <i>pleniceps</i> (Aust.) Lindb.	—	—				
<i>Chiloscyphus ascendens</i> Hook. & Wils.				—	—	+
“ <i>polyanthus</i> (L.) Corda	+	+	—	+	—	+
<i>Cololejeunea Biddlecomiae</i> (Aust.) Evans			+	+		+
<i>Diplophyllia albicans</i> (L.) Trevis.	+					
“ <i>apiculata</i> Evans				+	+	+
“ <i>taxifolia</i> (Wahl.) Trevis.	+	+	+	+	+	+
<i>Frullania Asagrayana</i> Mont.	+	+	+	+	+	+
“ <i>Brittoniae</i> Evans				+	+	+
“ <i>Eboracensis</i> Gottsche	+	+	+	+	+	+
“ <i>Oakesiana</i> Aust.	+	+	+			
“ <i>plana</i> Sulliv.					—	+
“ <i>riparia</i> Hampe		+		—		+
“ <i>squarrosa</i> (R. Bl. & N.) Dumort.					—	+
“ <i>Tamarisci</i> (L.) Dumort.	+			—	+	
“ <i>Virginica</i> Gottsche				—	—	+
<i>Geocalyx graveolens</i> (Schrader.) Nees	+	+	+			+
<i>Gymnomitrium concinnatum</i> (Lightf.) Corda.	+	+				
“ <i>corallioides</i> Nees		+				
<i>Harpanthus scutatus</i> (Web. & Mohr) Spruce		+	+	—	—	+
<i>Jamesoniella autumnalis</i> (DC.) Steph.	+	+	+	+	—	+
<i>Jubula Hutchinsiae</i> (Hook.) Dumort.	+	+	+	+	—	+
<i>Jungermannia lanceolata</i> L.	+	+		+	—	+
“ <i>pumila</i> With.	—	+			—	+
“ <i>sphaerocarpa</i> Hook.		+				
<i>Kantia Sullivantii</i> (Aust.) Underw.				+		+
“ <i>Trichomanis</i> (L.) S. F. Gray	+	+	+	+	+	+
<i>Lejeunea cavifolia</i> (Ehrh.) Lindb.		+	+	+		+

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Lepidozia reptans</i> (L.) Dumort.	+	+	+	+	+	+
“ <i>setacea</i> (Web.) Mitt.	+		—	+	—	+
“ <i>sphagnicola</i> Evans						+
<i>Lophocolea Austini</i> Lindb.						+
“ <i>bidentata</i> (L.) Dumort.	—		—	—	—	+
“ <i>heterophylla</i> (Schrad.) Dumort.	+	+	+	+	+	+
“ <i>minor</i> Nees			+		+	+
<i>Lophozia alpestris</i> (Schleich.) Evans	+	+				
“ <i>barbata</i> (Schreb.) Dumort.	+	+	+	+	—	+
“ <i>bicrenata</i> (Schmid.) Dumort.		+	+	+		+
“ <i>Floerkii</i> (Web. & Mohr) Schiffn.		+				
“ <i>gracilis</i> (Schleich.) Steph.	+	+	+	+		
“ <i>incisa</i> (Schrad.) Dumort.	+	+	—	+	—	+
“ <i>inflata</i> (Huds.) M. A. Howe	+	+	+			+
“ <i>lycopodioides</i> (Wallr.) Cogn.	+	+				
“ <i>Lyonii</i> (Tayl.) Steph.	+	+	+			+
“ <i>Marchica</i> (Nees) Steph.	—			+		+
“ <i>ventricosa</i> (Dicks.) Dumort.	+	+	+	+	—	
<i>Marsupella emarginata</i> (Ehrh.) Dumort.	+	+	+	+		+
“ <i>sphacelata</i> (Gieseke) Dumort.	+	+	+			+
“ <i>ustulata</i> (Hüb.) Spruce		+				
<i>Mylia anomala</i> (Hook.) S. F. Gray	+					+
“ <i>Taylori</i> (Hook.) S. F. Gray	+	+	+		—	
<i>Nardia crenulata</i> (Smith) Lindb.	+	+	—	+	+	+
“ <i>haematosticta</i> (Nees) Lindb.		+				
“ <i>hyalina</i> (Lyell) Carringt.	+		+	+		+
“ <i>obovata</i> (Nees) Lindb.	+	+				
<i>Odontoschisma denudatum</i> (Mart.) Dumort.		+	+	+	—	+
“ <i>prostratum</i> (Swartz) Trevis.				+		+
<i>Plagiochila asplenioides</i> (L.) Dumort.	+	+	+	+	+	+
“ <i>Sullivantii</i> Gottsche		+				+
<i>Porella pinnata</i> L.		+	+	+	—	+
“ <i>platyphylla</i> (L.) Lindb.	+	+	+	+	+	+
“ <i>rivularis</i> (Nees) Trevis.						+
<i>Ptilidium ciliare</i> (L.) Nees	+	+	+	+	+	+
<i>Radula complanata</i> (L.) Dumort.	+	+	+	+	+	+
“ <i>obconica</i> Sulliv.						+
“ <i>tenax</i> Lindb.		+				+
<i>Scapania convexula</i> C. Müll. Frib.	+					
“ <i>curta</i> (Mart.) Dumort.	+	+				
“ <i>irrigua</i> (Nees) Dumort.	—	+				+
“ <i>nemorosa</i> (L.) Dumort.	+	+	+	+	+	+
“ <i>paludosa</i> C. Müll. Frib.		+				
“ <i>subalpina</i> (Nees) Dumort.	+					

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Scapania umbrosa</i> (Schräd.) Dumort.	+	+				
“ <i>undulata</i> (L.) Dumort.	+	+	+	+	+	+
<i>Sphenolobus exsectaeformis</i> (Breidl.) Steph. . .		+				
“ <i>exsectus</i> (Schmid.) Steph.		—	—	—		+
“ <i>Michauxii</i> (Web.) Steph.	+	+	+	+		
“ <i>minutus</i> (Crantz) Steph.	+	+	+			
<i>Temnoma setiforme</i> (Ehrh.) M. A. Howe . . .	+	+	+			
<i>Trichocolea tomentella</i> (Ehrh.) Dumort. . .	+	+	+	+	—	+

ANTHOCEROTACEAE.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Anthoceros laevis</i> L.	+	+	—	+	+	+
“ <i>punctatus</i> L.			—	—	—	+
<i>Notothylas orbicularis</i> (Schwein.) Sulliv. . .				+	—	+

GALIUM ERECTUM AND *ASPERULA GALIOIDES* IN AMERICA.—While at the Gray Herbarium recently the writer showed specimens of a plant found growing at Southington, Connecticut, which he supposed to be *Galium Mollugo*, L., but called attention to the fact that in some respects it did not agree with the descriptions of that species. Mr. Fernald then made a careful examination of the material at the Herbarium finding as a result that the plant above noted as well as specimens from some other stations should be referred not to *G. Mollugo*, but to the nearly related *G. erectum*, Huds.

It is not strange that the two species have been confused by collectors as *Galium erectum* is not reported in any of our Manuals as growing in America. *G. Mollugo* has panicled cymes, of which the branches are short and forking, the very numerous flowers being borne on strongly diverging pedicels. The inflorescence of *G. erectum* is of the same general form but has cymes with fewer and more erect branches, the much less numerous and larger flowers being borne on ascending pedicels. As far as shown by the material at the Gray Herbarium, *G. erectum* is confined to Nova Scotia and New England, its range being from Nova Scotia to Connecticut. *G. Mollugo* has a wider distribution, ranging from Newfoundland southward through the Middle States.

When Mr. Fernald was looking up the above mentioned species the writer showed him a specimen of another plant apparently also a

Galium and found growing with *G. erectum*, but not answering to any description in our Manuals. This Mr. Fernald determined to be *Asperula galioides*, M. Bieb. and stated this to be the first report of the species in New England. There is also a specimen of this plant at the Gray Herbarium, from the Michigan Agricultural College distributed as *Galium Mollugo*. These two are the only stations at present known at which the plant has been collected in this country. As the name indicates it has every appearance of being a *Galium* but is separated from that genus on account of the corolla, which, instead of being wheel-shaped and without a definite tube, is tubular-campanulate below the flaring limb.—C. H. BISSELL, Southington, Connecticut.

SOME VARIATIONS OF TRIGLOCHIN MARITIMA.

M. L. FERNALD.

THE common Arrow-grass, *Triglochin maritima*, is uniformly described in our floras as well as those of Europe, and in Engler and Prantl's *Natürlichen Pflanzenfamilien*, as having 6 carpels. Yet in July, 1902, while examining with Dr. G. G. Kennedy, and Messrs. J. F. Collins and E. F. Williams the *Triglochins* on the shore of Schooner Cove, at Cutler, Maine, the writer was surprised to find below high-water mark a belt of *T. maritima* with carpels varying in number from 3 to 6. Examination of these flowers shows that in some cases there are 5 normal carpels and a sixth undeveloped one, while in others the sixth is quite wanting. In several cases there are merely 4 good carpels, and in a few flowers 3 good carpels and a single undeveloped one.

Higher upon the beach, just above high-water mark, normal *Triglochin maritima* with 6 carpels was growing with the slender 3-carpelled *T. palustris*. The belt of *T. maritima* with 3, 4, 5, or 6 carpels was, as stated, considerably below high-water mark, and twice a day it was entirely covered by the chilling ocean water. The plants of this belt were very low and caespitose, forming dense clumps a decimeter or so in height, with racemes only 2 to 6 cm. long, and often distorted or umbelliform. The dwarf caespitose

development of the plant was apparently due to the discouraging conditions under which it grew, for the *T. maritima* above tide-limit grew tall and with the elongate racemes ordinarily expected in that plant.

That the remarkable reduction of carpels in the periodically refrigerated plant was in any way due to its unfavorable habitat is not so clear, for under similarly adverse conditions, at the mouth of the Tête-à-Gouche River, in Gloucester County, New Brunswick, *Triglochin maritima* with the normal 6 carpels was later found by Mr. Williams and the writer fruiting when only 3 to 6 cm. high, while in warmer parts of the marsh tall plants often had only 5 carpels; and a sheet in the Gray Herbarium shows a specimen of characteristic *T. maritima* 6 dm. high, collected by David Lyall on the Kootenai River in Idaho or British Columbia, with only 3 carpels. It seems probable, then, that under ordinary circumstances the number of carpels in *T. maritima* may vary from 3 to 6, and that this variation is unaccompanied by concomitant differences in size or habit of the plant.

The Annual Meeting and Field Day of the JOSSELYN BOTANICAL SOCIETY OF MAINE will be held at Skowhegan, June 29th to July 3rd, 1903. For detailed information, apply to Miss D. H. MOULTON, Secretary, 9 Hill Street, Portland Maine.

A HITHERTO UNDESCRIBED PIPEWORT FROM NEW JERSEY.—The following species occurs so near the southwestern boundary of New England that it may well be sought in Connecticut.

ERIOCAULON Parkeri, n. sp. Caespitosum pumilum 6–11 cm. altum glaberrimum, caule subnullo, radice fibris numerosis albis transverse septatis composita, foliis tenuibus planis lanceolato-linearibus a basi 3–4 mm. lata ad apicem peracutum gradatim attenuatis 3–6 cm. longis circa 7–9-nervatis reticulatis quasi fenestratis, pedunculis 10–22 erectis subrigidis obscure circa 7-angulatis 5–10 cm. altis, capitulis monoecis depressis 3–4 mm. diametro a squamis plurimis subhyalinis non lucidis late ellipticis glabris flores aequantibus et eis arcte adpressis suffultis; floribus 2-meris, ♀ exterioribus, sepalis cymbiformibus 1.7 mm. longis fuscis glaberrimis vel prope apicem subtruncatum obscure parceque pubescentibus, petalis oblanceolato-oblongis 1.5 mm. longis extus ad apicem sparsim albo-pubescentibus intus ad apicem glandula nigra munitis, ovario compresso 1 mm. longo et lato, stylo 0.8 mm. longo, stigmatibus 2 filiformibus,

seminibus ovoideis rubro-brunneis 0.7 mm. longis basi truncatis; floribus ♂, sepalis 2 anguste spatulatis apice sparse pubescentibus, petalis perbrevibus nigroglanduliferis, staminibus 4, antheris quadratis non longioribus quam latis.— NEW JERSEY: on the shore of the Delaware River near Cooper's Creek, *T. P. James*, September, 1858 (hb. Gr.); on the shore of the Delaware River, between high and low water mark, Camden, *C. F. Parker*, 7 October, 1877 (hb. Gr.).

Both specimens of *E. Parkeri* were distributed as *E. septangulare*, but they differ from that species in their numerous heads scarcely 4 mm. in breadth, and especially in the form of the fruiting head, which in *E. Parkeri* is campanulate at the base, the erect flowers being surrounded by an obvious and persistent involucre of their own length in the manner of a composite, while in *E. septangulare* the fruiting head through the widely spreading or even reflexed position of the outer flowers becomes ellipsoidal somewhat surrounding and obscuring the more or less deflexed involucre. The short thick pubescence, which in *E. septangulare* renders the head white is in *E. Parkeri* almost lacking.

The species is obviously related to the southern *E. Ravenelii* (unfortunately omitted by Ruhland from his treatment of the family in the Pflanzenreich), but *E. Ravenelii* is a much more slender plant with filiform peduncles and shining involucre scales.

It is a pleasure to dedicate this species to the late Charles F. Parker, an able botanist, for many years one of the curators of the Philadelphia Academy of Natural Sciences.— B. L. ROBINSON, Gray Herbarium.

FOR the privilege of using the excellent portrait engraving, which in our last issue accompanied the biographical sketch of the late Lorin Low Dame, the editors and managers of RHODORA wish to express their gratitude to Mr. R. B. Lawrence, Chairman of the School Committee of Medford, Massachusetts.

Vol. 5, no. 53, including pages 121 to 156, a reprint of plate 46, and a portrait (unnumbered), was issued 3 May, 1903.

BOTANICAL PUBLICATIONS

SYNOPTICAL FLORA OF NORTH AMERICA, by A. GRAY and others. Vol. I. Fascicles 1 and 2. A critical treatment of forty-five families of polypetalæ (*Ranunculaceæ* to *Polygalaceæ*) 1895-1897. \$5.20.—GRAY HERBARIUM of Harvard University, Cambridge, Mass.

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